IJCAT - International Journal of Computing and Technology, Volume 6, Issue 4, April 2019
ISSN (Online) : 2348-6090
www.IJCAT.org
Impact Factor: 0.835

Smart Bike Stand

[1] Sarthak Pahwa; [2] Rakshit Ahluwalia; [3] Shraddha Pandey

[1] IT Department, SRM Institute of Science and Technology
Delhi-NCR Campus, Ghaziabad, India.

[2] IT Department, SRM Institute of Science and Technology
Delhi-NCR Campus, Ghaziabad, India.

[3] IT Department, SRM Institute of Science and Technology
Delhi-NCR Campus, Ghaziabad, India.

Abstract - Bikes are the most affordable as well as one of the most commonly used transport mediums by teenagers and youngsters, various venues have bike stands to hold them but lacks the security to protect them. The bike owners have to carry heavy commercial bike locks with no guaranty of complete security. The 'Smart Bike Stand' is an approach to address these issues. Smart Bike Stand is designed with a sole purpose to improve current systems for parking bikes, it provides space along with security. Smart Bike Stand enables the owners to park their bikes in the smart stands enforced with digital security, hence ensuring the safety of their beloved transport medium. Smart bikes stand provides a unique identity to every bike and link them with their owners' profile, hence keeping unauthorized persons at the edge. The bikes parked in these stands can only be unlocked by their owners provided their proper authorization and verification.

Keywords - *Transport medium, Security, Commercial bike locks, Smart stands, Digital Security, Safety, Unauthorized persons, Authorization, Verification*

1. Introduction

'Smart Bike Stand' is a service in which bikes are protected by the stands enforced with digital security, hence preventing the need of carrying heavy commercial locks for locking and unlocking the bikes. The user need not to worry about bike security anymore, ultimately promoting the use of bikes which is the safest and most affordable means of transport nowadays.

The Smart Bike stands can also be viewed or implemented as a bike sharing system in which bikes a re made available to the user for a short period of time on the basis of a price or for free. In this system the bikes can be issued at a particular "dock" depending upon the user location and can be returned at any other docks. Docks are generally the hardware implementation of the proposed system, they are the special bike racks equipped with digitalized security lock which are inbuilt in them. The locks on the bikes can only be released by computer control generally in the form of a web-based application which can be easily accessed by the user even through their mobile phones.

The user needs to chooses the dock location closest to his current location, then select the bike from the list of available bikes, the user is identified with the help of their mobile number, as soon as user enters the number after selecting the bike, he/she needs to click on the unlock button to issue it. As soon as the unlock button is pressed the details of the bike along with current date and time and the mouser mobile number is recorded in a NoSQL database or CSV, and a slip is issued, user are now free to ride the bike. After the ride the bike can be returned to the dock at any location, user needs to press the lock button there for returning the bike, after which a return slip with current date and time along with price (if applied) is issued to the user.

2. Importance of "Smart Bike Stand"

Bike stands in their current state can only provide a space to support the bikes, but doesn't provide any significant way to ensure the security of the bikes. Moreover, the owner needs to carry their own heavy commercial bike locks, that stand no chance against a pair of metal cutters. This imposes an unavoidable risk over the parked bikes ultimately resulting in the great loss of the owners. Some of the major risks threatening the parked bikes are as follows:

1. Risks of bikes been robbed
2. Risks of being tampered with
3. Lack of security
4. Unmonitored locations
5. Unauthorized access.

The proposed system is designed with the aim of eliminating all these potential threats and enforcing an additional level of digital security over current systems of bike stands, ultimately promoting the use of bikes which are currently most affordable, healthy, pure and safe means of transportation, especially for teenagers and youngsters.

This system when completed and implemented would change the whole idea of bike stands and that for good, a mere cycle stand transformed into a most secure and protected facility, while fulfilling its purpose in a modern, better and more secure manner.

3. Overview of the project

Main components of the projects are as follows:

3.1 Accessing the website

The user first needs to access the website using their convenient devices like mobile or laptop, by entering the domain name or ip address of the server on which site is running.

3.2 Map

The user will able to view a well detailed map of the facility with all the available bike stands closer or father to the user, allowing them to book the bike after entering their phone number for identification.

3.3 Issue and swap

After selecting the bike, the user can book the bike from the website itself and swap or unlock the bike from the dock at that location.

3.4 Ride

The bike is now issued to the user enabling to ride and return it after its purpose has been fulfilled.

3.5 Return

After riding the user can return the bike to any of the closest stands, as the system is centrally monitored.

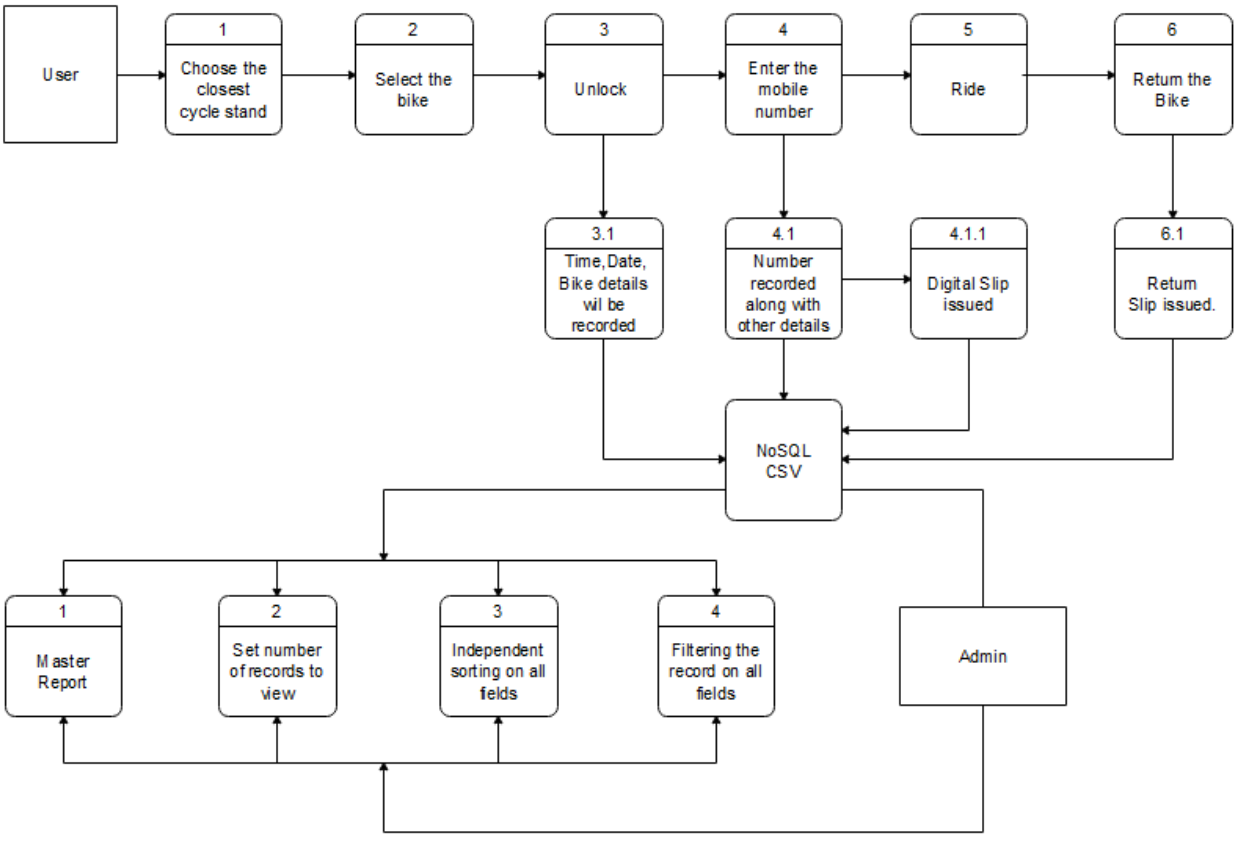

Fig. 1. DFD Level 2

Smart bike stand is a system that allows user to issue the bike from a location closest to him on the map and return it to any other location under same administration.
User first needs to access the site through their mobile phones or laptop depending upon their convenience, a well detailed map helps the user to select and choose the bike stand nearest to their location.

The system uses a NoSQL database that manages the list of all the bikes available at the selected dock, the user needs to select a bike from the list and click on unlock button to unlock and issue the bike.

As soon as the unlock button is clicked the user is asked to enter his/her mobile number. The details like mobile number, current date, current time and bike details are recorded in the database and a digital slip is issued.

User is now free to ride the bike and return it to the closest dock, after that a digital slip is issued again acknowledging the user for using the service.

The NoSQL database is managed by the administrator, the administrator panel provides certain features like master report, set number of records to view, sorting of records and filtering the records.

5. Conspicuousness

Nowadays people try to avoid using bikes, that is one of the safest and affordable means of transportation, mostly due to the lack of security, safety and space availability at the bike stands. This system has the significance of eliminating all these anomalies by enforcing a layer of digital security over these stands once in place. Someother benefits of switching to smart bike stands are as follows:

5.1 Increased Security
5.2 Real-Time Monitoring system
5.3 Auto-alerting system
5.4 Hassle-free locking and unlocking
5.5 Proper authorization
5.6 Prevents unwanted damage or tampering
5.7 Easy recovery
5.8 Eliminating the need of carrying heavy locks
5.9 Eliminating unattended accessing
5.10 Centrally Monitored

6. Conclusions

The science and technology are ever-growing, every day we receive a new news teasing a new invention or even modifications in the older ones, and every new modification provides support for new technologies and scientific trends which are ever changing and ever improving for making our lives a little bit more easier than before, and this ever-growing nature of modern technology is going to last forever, so to keep up with them we need to grow too. The increase in modern technology also increases the demands for the improved security as the threats and risks are also increasing. Nowadays a noticeable number of firms and systems are taking a step forward in enforcing digital security over there assets, as digitalized security are currently the most secure form of security. Similarly, traditional assets like car locks, door locks and stands etc. are being automated, because it provides better security along with lesser physical effort, hence adding a new level a luxury and surety to one's life.

References

[1] Bike Share: A Synthesis of the Literature, Article in Transport Reviews, Elliot Fishman, Simon Washington & Narelle Haworth (2013) March 2013, DOI:10.1080/01441647.2013.775612.
[2] Balancing a Dynamic Public Bike Sharing System, Claudio Cotardo, Catherine Morenci, Louis- Martin Rousseau, March 2012, CIRRELT - 2012-09.
[3] Smart Bike Sharing System to make the City Even smarter.
Monika Rani* and O. P. Vyas
Department of Information Technology, Indian Institute of Information Technology, Allahabad.
{(monikarani1988 and dropvyas) @gmail.com}
[4] Bike Share: A Synthesis of the Literature
Elliot Fishman ,Simon Washington &Narelle Haworth
Pages 148-165 | Received 12 Sep 2012, Accepted 09 Feb 2013, Published online: 11 Mar 2013.
[5] Public cycle sharing systems
A planning toolkit for Indian cities, National Public Bicycle Scheme December 2012, Ministry of Urban Development Government of India.
[6] Public cycle sharing system for Delhi
Institute for Transportation and Development Policy, Government of the National Capital Territory of Delhi August 2015, Government of National Capital Territory of Delhi.
[7] http://www.bikeep.com
[8] http://www.designboom.com/technology
[9] https://www.w3schools.com/php/
[10] https://www.w3schools.com/html/
[11] https://www.w3resource.com/mongodb/nosql.php
[12] https://www.phpknowhow.com/basics/working-with-xampp/